

W. S. LYTLE.
 PASSENGER REGISTERING DEVICE FOR CARS.
 APPLICATION FILED JUNE 26, 1908.

924,481.

Patented June 8, 1909.
 6 SHEETS—SHEET 1.

Fig. 1.

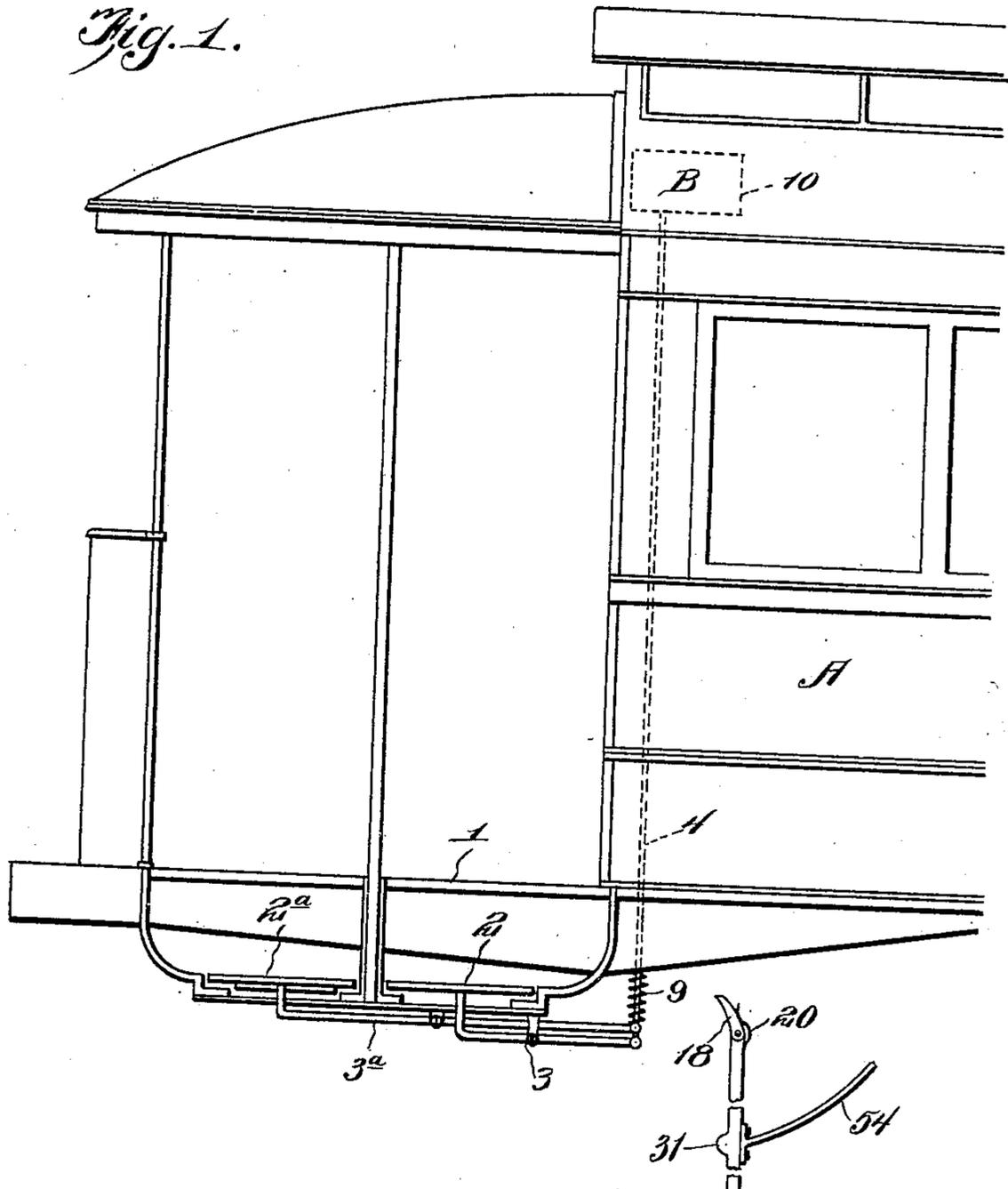
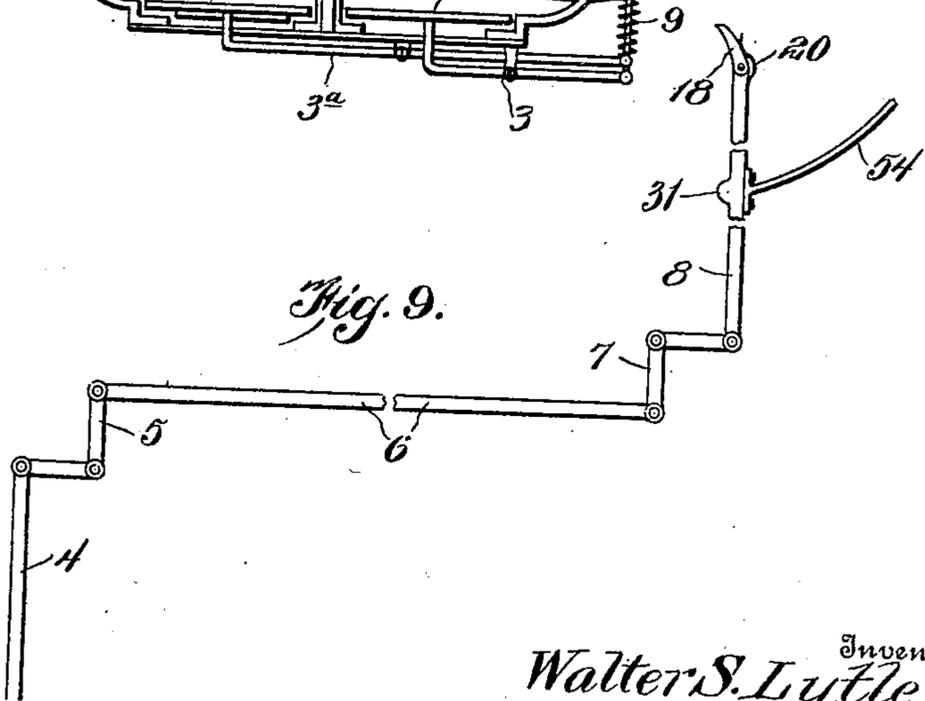


Fig. 9.



Witnesses

Louis R. Heinrichs
at Broadway

Inventor
Walter S. Lytle

Victor J. Evans
 Attorney

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6 SHEETS—SHEET 2.

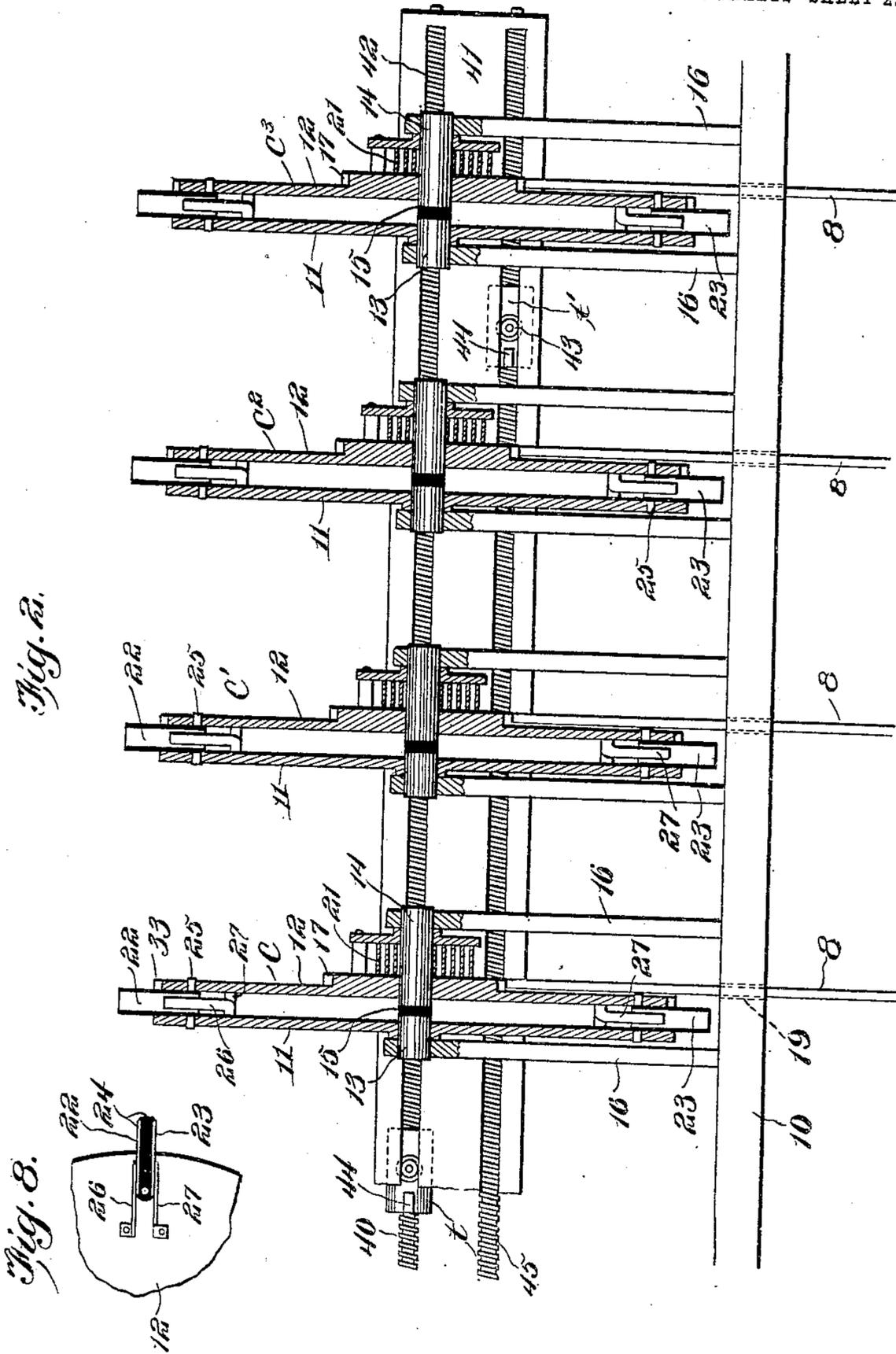


Fig. 2.

Fig. 8.

Witnesses

Louis S. Heinrichs
 C. Bradway

Walter S. Lytle ^{Inventor}

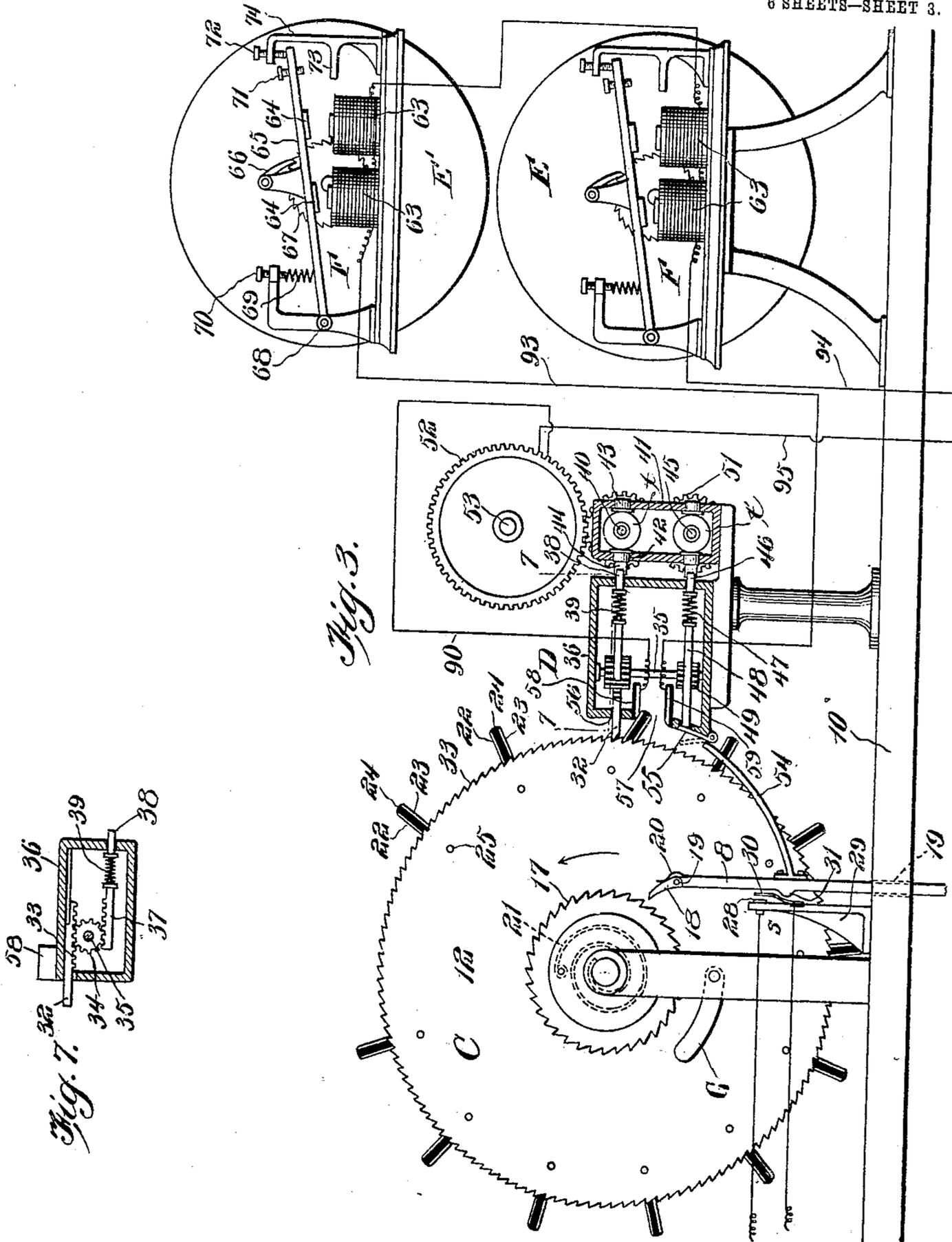
Victor J. Evans ₃₃₇
 Attorney

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6 SHEETS—SHEET 3.



Inventor
 Walter S. Lytle

334 Victor J. Evans
 Attorney

Witnesses

Louis R. Heinrichs
 C. Bradway.

W. S. LYTLE.
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6 SHEETS—SHEET 4.

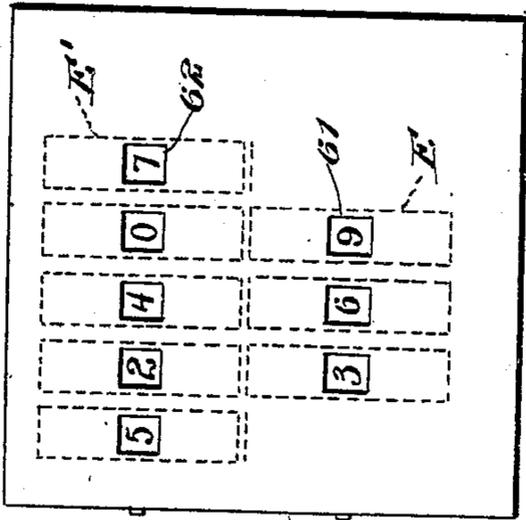


Fig. 6.

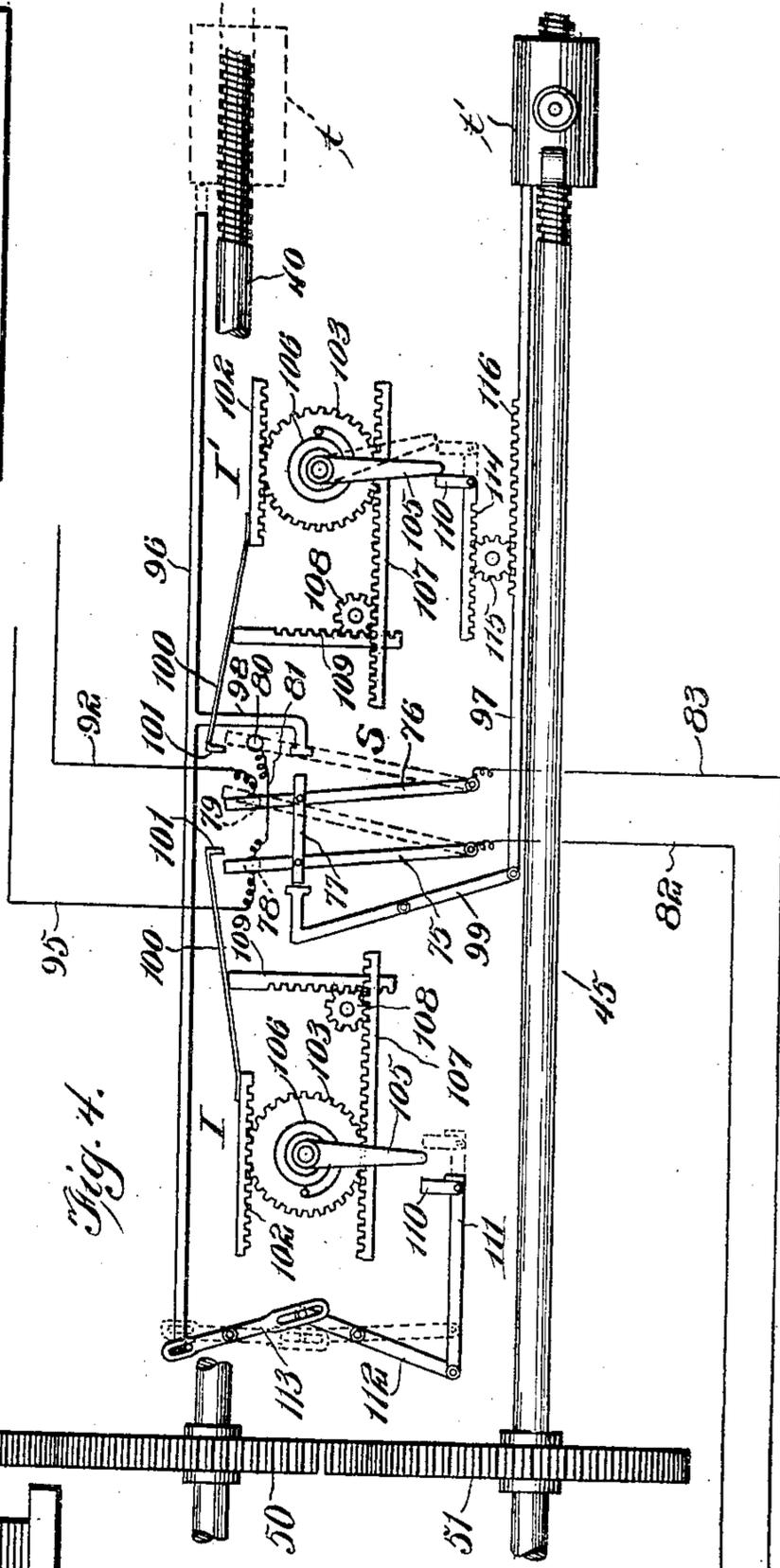
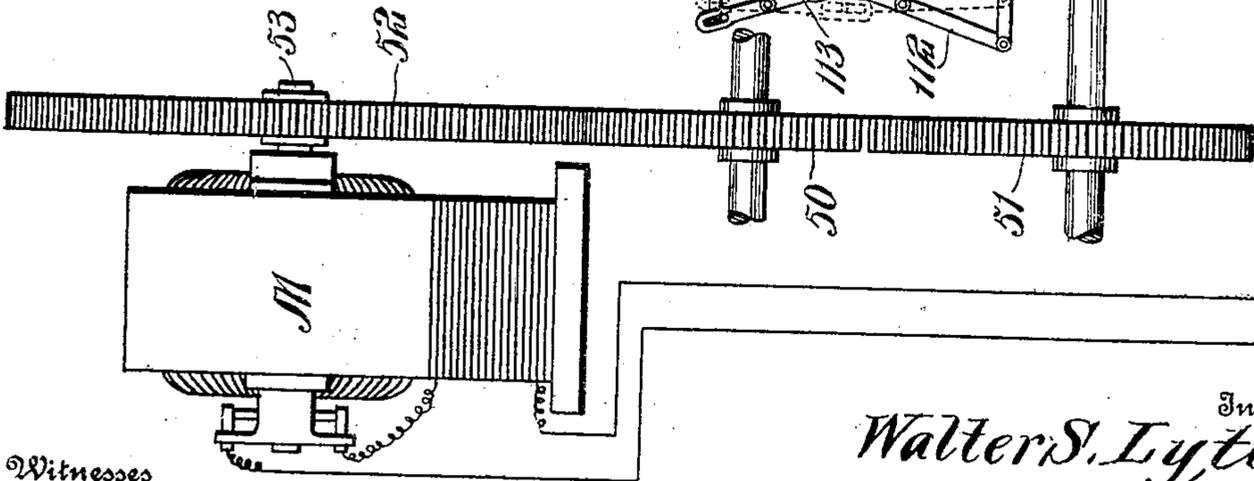


Fig. 4.



Witnesses

Louis S. Heinrichs
 C. Bradley.

Inventor
 Walters S. Lytle

By Victor J. Evans
 Attorney

W. S. LYTLE,
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6 SHEETS—SHEET 5.

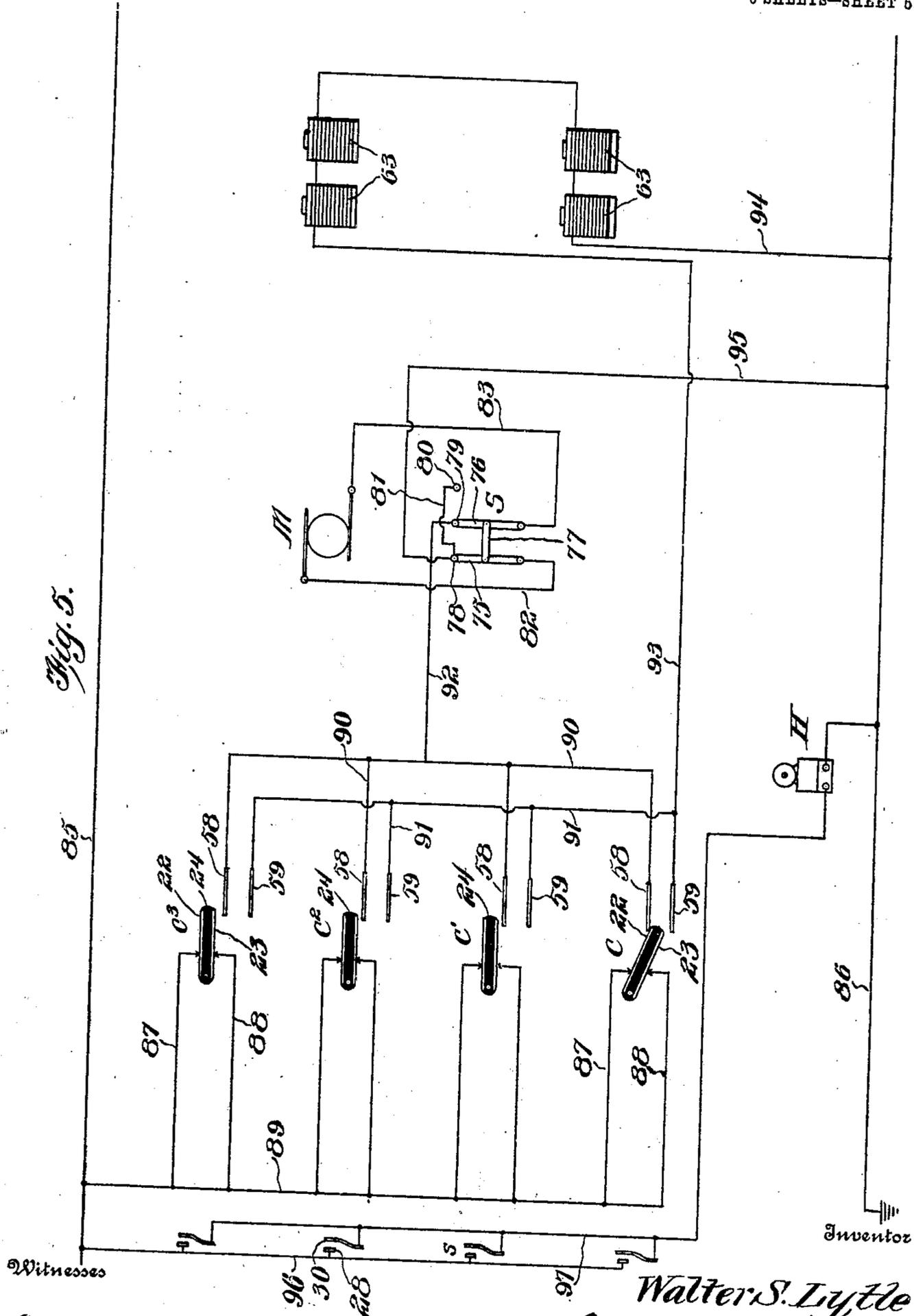


Fig. 5.

Witnesses

Louis S. Heinrichs
 of Broadway

Walter S. Lytle
 Victor J. Evans
 Attorney

W. S. LYTLE.
 PASSENGER REGISTERING DEVICE FOR CARS.
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 6 SHEETS—SHEET 6.

Fig. 10.

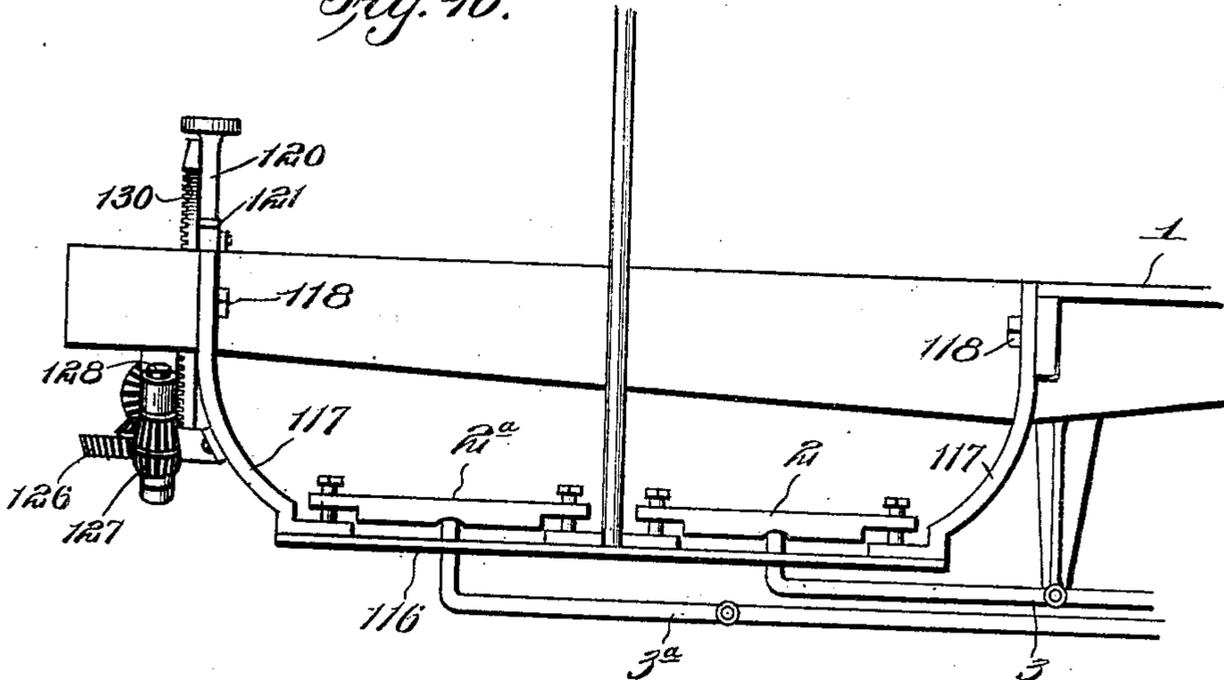


Fig. 11.

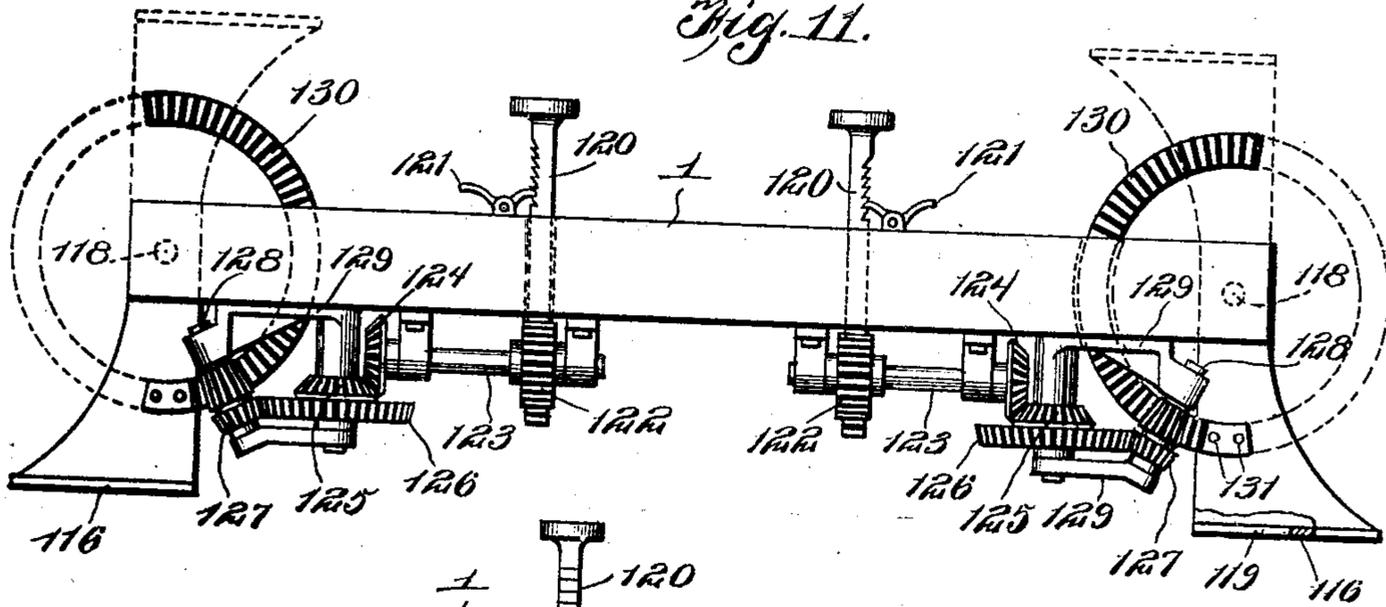
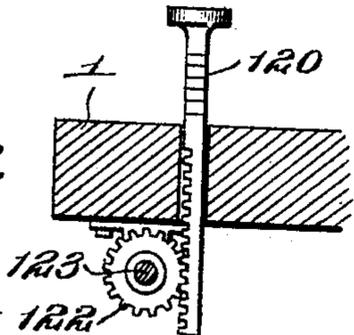


Fig. 12.



Witnesses

Louis P. Heinrichs
 K. Allen

334

Walter S. Lytle
 Inventor

Victor J. Evans
 Attorney

UNITED STATES PATENT OFFICE.

WALTER S. LYTLE, OF PHILADELPHIA, PENNSYLVANIA.

PASSENGER-REGISTERING DEVICE FOR CARS.

No. 924,481.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed June 26, 1908. Serial No. 440,599.

To all whom it may concern:

Be it known that I, WALTER S. LYTLE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Passenger-Registering Devices for Cars, of which the following is a specification.

This invention relates to a registering device intended for use on street or railroad cars to indicate the number of passengers carried, or for use at the entrances of museums, expositions and other places to indicate the attendance.

The invention has for one of its objects to improve and simplify the construction and operation of apparatus of this character so as to be comparatively simple and inexpensive to manufacture and install, and thoroughly reliable and efficient in use.

Another object of the invention is the provision of an automatically actuated registering device common to a plurality of steps or platforms so as to show the total number of persons entering or leaving a car.

A further object is the employment of a contact-carrying element that is automatically moved step by step by the persons entering or leaving the car, and which is automatically returned to normal position at a certain time so as to cause the contacts to intermittently make and break a circuit including electrical means for actuating the registering device to indicate the total number of passengers entering or leaving the car.

A still further object is the provision of a plurality of such contact-carrying wheels which are individually connected with the steps of the car so that they can be operated independently, and which are adapted to be automatically released by a motor-driven traveler so that the wheels will be periodically returned to normal position and at the same time cause the electric circuit to be successively opened and closed for operating the registering means.

An additional object is the employment of two sets of contacts on the step-actuated wheels, of which one set is used for closing the circuit of the motor that drives the wheel-releasing traveler or travelers, while the other set is used for closing the circuit including the electrical means that actuates the registering device.

With these objects in view and others, as will appear as the description proceeds, the

invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one of the embodiments of the invention, Figure 1 is a side elevation of one end of a car equipped with the improved passenger registering mechanism. Fig. 2 is a central longitudinal section of the contact-carrying elements actuated step by step by the depression of the car step. Fig. 3 is a side view of one of the contact-carrying elements and actuating and releasing mechanism therefor, together with the electrically-operated registering devices. Fig. 4 is a fragmentary plan view of the mechanism for driving the followers that release the contact-carrying elements, in combination with the automatically-actuated pole-changing switch for the motor circuit. Fig. 5 is a diagrammatic view of the circuit connections. Fig. 6 is a front view of the registering device. Fig. 7 is a sectional view on line 7-7, Fig. 3. Fig. 8 is a detail view of one of the pairs of contacts of a contact-carrying element. Fig. 9 is a detail view of the connection between one of the depressible steps and its respective contact-carrying element of the indicating mechanism. Fig. 10 is a side elevation showing means for tilting a car step upward out of the way when not in use. Fig. 11 is an end view of a car platform showing folding steps arranged at opposite sides thereof. Fig. 12 is a detail vertical section showing a portion of the step-folding mechanism.

Similar reference characters are employed to designate corresponding parts throughout the several views.

In the present instance, I have elected to illustrate the invention in connection with a street car, but it is to be understood that it may be used on other cars or at the entrances of such public places where the attendance is desired to be registered.

Referring to the drawings and particularly to Fig. 1, A designates the body of the car which has a platform 1 to and from which persons pass by the steps 2 and 2^a. These steps are mounted on rods 3 and 3^a in such a manner as to be depressed by the weight of a person treading thereon in boarding or leaving the car. In this figure, steps are shown only at one side but it will be understood

that depressible steps are also employed at the opposite side of the car platform. These depressible steps actuate the registering mechanism B located within the body of the car at the end thereof where the usual cash registers are arranged. The rods 3 and 3^a of each pair of steps are independently connected by vertical rods 4 with the registering mechanism B, and these rods 4 extend upwardly between the inner and outer walls of the car body and have their upper ends each connected with a bell crank lever 5, in turn connected by a link 6 with the second bell crank lever 7 which is connected with the lower end of the pawl-carrying rod 8 that operates its respective contact-carrying element, as will be hereinafter more fully explained. In the other end of the car will be a second registering mechanism connected in the same manner with depressible steps so as to register the number of passengers entering or leaving the car at that end. The depressible steps are normally maintained in raised position by springs 9 on each rod 4, the springs being depressed when a person treads on any step.

The registering mechanism B is mounted within a suitable casing 10 which contains the contact-carrying elements C, C¹, C², C³, the releasing mechanism D therefor, the registering devices E, E¹, the electrical motor M for operating the releasing mechanism, the automatically actuated pole-changing switch S, the electrical means F for actuating the registering devices E and E¹, and the circuit connections.

There are as many contact-carrying elements C, C¹, etc., as there are depressible steps on the car at one end, or in case of open or summer cars, on each side of the car and, as shown in Figs. 2 and 3, each element comprises a pair of spaced metal disks 11, 12, mounted on a shaft composed of two parts 13 and 14 insulated from each other by a piece of insulation 15, the shaft being mounted in bearing posts 16 rising from the floor of the casing 10. On the disk 12 is a ratchet wheel 17 with which the pawl 18 on the upper end of the rod 8 is adapted to engage when its respective step is depressed so as to impart a partial turn to the contact-carrying element. The pawl-carrying rods 8 extend upwardly through openings 19 in the bottom of the casing 10 to their respective contact-carrying elements, as shown in Fig. 2, and each pawl 18 is pivoted at 19 to its rod 8 and a spring 20 on such rod yieldingly holds the pawl in operative position to engage the teeth of the ratchet wheel 17. Each contact-carrying element is provided with a coil spring 21 that is fixed at its inner end and secured to the element at the other end for the purpose of returning the element to normal position at the proper time. Each element is provided with two sets of contacts 22, 23,

one of each set being mounted with one of the other set upon a hard rubber or other insulating arm 24. These arms are mounted on pivots 25 carried by the disks 11, 12, and project radially beyond the peripheries of the latter. The arms are yieldingly maintained in radial position by leaf springs 26, 27, as clearly shown in Fig. 8, and these springs are mounted respectively on the disks 11, 12, and serve as means for electrically connecting the contacts 22, 23, with such disks. The contacts 22 are adapted to close the circuit that includes the motor operating the releasing mechanism D, while the contacts 23 are adapted to close the circuit including the electrical means for operating the registering devices E, E¹. Associated with each pawl-carrying rod 8 is a switch s, Fig. 3, that consists of a fixed contact 28 on a bracket 29 and a spring contact 30 mounted on and insulated from the bracket and adapted to be moved into engagement with the fixed contact by a cam 31 on the rod 8 when the latter is raised by a person treading on the step connected with such rod. This switch controls a circuit in which is included a gong so that the latter will be sounded each time a step is depressed and kept ringing as long as a passenger remains on the step, hence it will be the duty of the conductor to see that the steps are always clear. Coöperating with the pawl 18 of each contact-carrying element is a back-acting pawl 32 which engages ratchet teeth 33 in the disk 12, so that every time the rod 8 is raised by the depression of its step, the contact-carrying elements will be moved one step. Thus as the passengers enter and leave the car by the various steps, the contact-carrying elements will be moved intermittently in an anti-clockwise direction, Fig. 3, until the releasing mechanism D comes into play to permit the contact-carrying elements to return to normal position and in so doing, successively make and break the circuit that includes the electrical means F for actuating the registering devices E, E¹.

The releasing mechanism D serves to retract the back-acting pawl 32 of the contact-carrying elements C, C¹, etc. For this purpose, each pawl is provided with rack teeth 33', Figs. 3 and 7, that mesh with a pinion 34 arranged on a shaft 35 within the casing 36. Also meshing with this pinion and at a point opposite from the rack bar 33 is a rack bar 37 which is disposed in line with a follower 38, and interposed between the latter and rack bar is a spring 39. This spring permits the pawl 32 to freely ride over the ratchet teeth 33 as the contact-carrying element turns. The follower 38 is located in the path of a traveler t that is reciprocated by the rotation of the screw 40 on which the traveler is mounted. The traveler t moves in a guide frame 41 that has parallel grooves 42 in which

ride rollers 43 on the traveler so as to thereby prevent the traveler from turning as the screw is rotated. Projecting from the traveler is an abutment 44 that is adapted to strike the follower 38 and press the latter inwardly and act through the spring 39 and rack 37 to turn the pinion 34 and retract the pawl 32. As shown in Fig. 2, the screw 40 extends across all the contact-carrying elements C, C', etc., and the traveler in moving from one end of the screw to the other retracts the pawls 32 of the contact-carrying elements successively, so that periodically the said elements can be automatically returned to normal position. In order to reduce the length of the intervals between the succeeding retractions of each back-acting pawl 32, an additional traveler *t'* is employed which is like the traveler *t* that is mounted on a second screw 45 and is adapted to be at one end of its screw while the traveler *t* is at the opposite end of the other screw, and in traveling back and forth, the travelers will retract the pawls 32 twice as often as would be the case with only one traveler. The traveler *t'* operates through a follower 46 and spring 47 to move the rack bar 48 that meshes with the pinion 49 on the shaft 35 so as to thereby turn the latter in a direction for retracting the pawl 32. On the ends of the threaded shafts 40 and 45, Figs. 2 and 4, are pinions 50 and 51 that mesh with each other so that said shafts will simultaneously rotate, and meshing with the pinion 50 is a gear wheel 52 on the shaft 53 of the motor M. In case either traveler should be in contact with its follower 38 or 46 and thereby hold the pawl 32 retracted when the rod 8 is raised, it is necessary to provide means for restoring the pawl to normal position so as to hold the contact-carrying element to the position it has been moved by the rod 8 as the latter is raised by a person treading on the step connected with such rod. For this purpose, the rod has a finger 54, Fig. 3, which engages a hinged member 55 on the casing 36, which member is adapted to press the rack bar 48 inwardly against the tension of the spring 47 and thus rotate the shaft 35 in a direction to project the pawl 32 into normal position.

The casing 36 of the mechanism D, Fig. 3, has a cam face 56 with which the contact-carrying arms 24 are adapted to engage as any element C, C', etc., rotates, and in this face is a slot 57 that contains separate contacts 58 and 59. As the contact-carrying elements C, C', etc., are turned step by step in an anti-clockwise direction, the metal contact strips 22 successively engage the stationary contact piece 58 and thereby complete the motor circuit. The motor circuit is practically maintained closed at all times by one or the other of the contact-carrying elements so that the travelers will move constantly back and forth, and as soon as the back-act-

ing pawl 32 of any element is retracted, such element will be turned to normal position by its spring 21 so that the other set of metal strips 23 on the arms 24 will successively engage the stationary contact 59 and thereby make and break the circuit including the electrical means F for actuating the registering devices E, E'. When the parts are in the position shown in Fig. 3, the third contact-carrying arm is maintaining the motor circuit closed and this means that three passengers have depressed the step since the follower of either screw last retracted the pawl 32. As soon as the pawl is again retracted, the element C will be turned from normal position, as before explained. It may, in some instances, be desirable to retard the return movement of the contact-carrying elements so that the making and breaking of the circuit of the electrical means F will not take place too rapidly, and for this purpose, a brake G, Fig. 3, may be employed to bear against each contact-carrying element to act as a retarding device therefor.

The front of the casing 10 is provided with slots 61 and 62 which expose the number-carrying wheels or drums of the registering devices E, E', the first device being used by the conductor to make out his report for each trip of the car, while the second device is used to indicate at all times the total number of passengers carried by the car for a given period. Since the registering mechanism is operated every time a passenger enters or leaves the car, it will, of course, be necessary to divide the number indicated by either device E or E' in half to give accurately the number of passengers carried. The number-carrying drums of these registering devices are operated by electrical means F, each means consisting of electro-magnets 63 that attract armatures 64 on the lever 65. The lever 65 carries a pawl 66 that engages a ratchet wheel 67 so that as the electro-magnets are energized, the ratchet wheel is turned so as to move the first number-carrying drum one step. As this drum is turned ten steps it will turn the next drum one step, as will be readily understood. The lever 65 is mounted on a bracket 68 and attached to the lever is a spring 69 for returning the latter, the spring being connected with an adjusting screw 70 on the bracket. The throw of the lever is controlled by adjustable screws 71, 72, which engage respectively a stop 73 on the bracket 74 and the lever itself, the screw 71 being carried by the lever. Both sets of electro-magnets are connected in series so that both registering devices E, E', will be simultaneously actuated.

When the travelers reach the ends of their strokes, the motor M is automatically reversed by means of a pole-changing switch S or other suitable device. In the present instance, this switch comprises a pair of blades

75, 76, connected by a cross bar 77 and adapted to engage contact points 78, 79, 80, the contact points 78, 80 being connected by the wire 81. The blades 75 and 76 are connected by wires 82, 83, with the terminals of the motor M and the contact points 78, 79, are connected to opposite sides of the supply circuit.

Referring to the diagram of the electric circuits shown in Fig. 5, 85 designates a conductor connected with the trolley or other current-collecting device of the car, and 86 is a grounded conductor. c, c^1, c^2, c^3 , represent the arms of the several contact-carrying devices C, C¹, etc., and the contacts 22, 23, are connected by wires 87, 88, with a common wire 89 that connects with the supply conductor 85. Associated with the arms c, c^1 , etc., are the stationary contacts 58, 59, which are connected respectively by wires 90 and 91 with the common wires 92, 93, leading to the central contact point 79 of the switch S, and to the electro-magnets of the registering devices E, E¹. The electro-magnets are connected to the ground conductor 86 by a wire 94 and the contact point 78 is connected also with the grounded conductor by a wire 95. The switches s of the bell circuit have their stationary contacts 28 connected by a wire 96 to the conductor 85, while the spring contacts 30 are connected by a wire 97 that is on the conductor 86, the bell H being connected with the wire 97 so as to ring when a step is depressed. When the arm c is in the position shown, current passes through the wire 85, wire 89, wire 87 connected with the arm c , contact 22, contact 58, wire 90, wire 92, switch blade 76, wire 83, motor M, wire 82, switch blade 75, contact points 78, wire 95, grounded conductor 86. The motor is thus operated so as to drive the travelers back and forth. When the contact 23 of any arm strikes the fixed contact 59, the circuit including the electro-magnets 63 will be closed, so that the registering devices will be operated.

The mechanism for automatically throwing the pole-changing switch S is illustrated in Fig. 4. This mechanism comprises push rods 96, 97, arranged in the path of the travelers t, t^1 , so that they will alternately actuate the push rods when the end of the stroke to the left is reached. The rod 96 is provided with an arm 98 that is adapted to engage the switch to move the blades thereof in one direction and the rod 97 is connected with a lever 99 arranged to throw the switch in the opposite direction. Since the movement of the travelers is comparatively slow, it is preferable to accelerate the throw of the switch during the last part of its movement so as to make quick contact with the contact points 78, 79, 80. For this purpose, quick acting devices I, I¹ are employed. Each device comprises a hook 100 formed of

a leaf spring having its free extremity bent into the bill 101, and the spring is connected with a rack bar 102. Meshing with this rack bar is a pinion 103 mounted on an arbor 104 that has connected therewith an arm 105. As the pinion 103 turns in one direction by moving the arm 105, a spring 106 is energized so that when the arm is released, the pinion will move in the opposite direction very suddenly to complete the throw of the switch. Meshing with the pinion 103 is a rack bar 107 which operates through a pinion 108 to reciprocate another rack bar 109 which serves to raise and lower the spring hook 100. The arm 105 of the device I is actuated by a trip 110 on the rod 111, the rod being operated by connected levers 112, 113, attached to the push rod 96. The trip 110 of the device I¹ is actuated by a rack bar 114 which meshes with a pinion 115 that in turn meshes with rack teeth 116 on the push rod 97. When the parts are in the position shown in Fig. 4, the switch S is about to be thrown by the traveler t^1 , and as the traveler continues to move to the left, the push rod 97 is actuated to simultaneously tilt the lever 99 and rotate the pinion 115. The pinion 115 operates through the parts 114, 110 to tilt the arm 105 and turn the pinion 103, so as to move the rack bar 102 to the left and advance the hook 100 so as to meet the blade 76 of the switch S as the latter is being moved to the right by the lever 99. After the bill 101 of the hook has been moved a certain distance to the left, the hook gradually lowers behind the blades 76 by reason of the rack bar 109 moving downwardly. As soon as the trip 110 passes under the extremity of the arm 105, the pinion 103 will suddenly return to normal position by the spring 106 and thus quickly complete the throw of the switch S. The return movement of the pinion 103 causes the rack bar 109 to be raised so as to lift the spring hook 100 out of engagement with the switch blade 76 for permitting the switch to be thrown in the opposite direction of the device I when that is brought into play by the traveler t .

In addition to the registering mechanism, it is in some cases desirable to provide means for folding the car steps out of the way when not in use, so as to prevent the use thereof when the car is in motion. To this end, I provide the mechanism illustrated in Figs. 10, 11 and 12, wherein it will be observed that the main folding step 116 is supported at opposite ends by hanger arms 117, the latter being pivotally connected at 118 to the car platform. By reference to Fig. 11, it will be observed that the step 116 is provided with slots 119 to receive the upstanding portions of the levers 3 and 3^a so as not to interfere therewith when the step 116 is in its operative position beneath the registering steps 2 and 2^a, as shown in Fig. 10.

Each of the folding steps 116 is folded upward from the full line position of Fig. 11 to the dotted line position of the same figure by means of a foot-operated rack bar or treadle 5 120 capable of being held at any point of adjustment by means of a foot-operated catch and trip 121. The rack bar 120 engages a pinion 122 on a shaft 123 journaled in bearings beneath the car sill or platform, as shown in Fig. 11, while the shaft 123 carries a bevel gear 124 which meshes with the corresponding bevel gear 125 on a short vertical shaft which also has fast thereon a relatively large spur gear 126 that meshes in turn with 15 a pinion 127 fast on an inclined shaft 128 mounted in suitable brackets or hangers 129 secured to the platform or sill. Fast on the same shaft 128 is an arcuate rack segment 130, one end of which is secured to the step 20 116, or rather, to one of the hanger arms 117 thereof, as shown at 131 in Fig. 11.

It will be understood that the operator, by depressing the rack bar 120, will operate the train of gears just hereinabove described with 25 the result that the step 116 will be swung from a pendent to an upstanding position, the two positions being clearly illustrated by full and dotted lines in Fig. 11. To release the step, the catch or trip 121 is moved out 30 of engagement with the rack bar 120, whereupon the weight of the step will cause it to fall to the full line operative position shown in Figs. 10 and 11.

Having thus described the invention, what I claim is:—

1. In an apparatus of the class described, the combination of a registering device, electrical means for operating the same, a contact-carrying element moved step by step in 40 one direction, automatically-actuated means for releasing the element to return to normal position, and a circuit including the said electrical means adapted to be intermittently closed and opened during the return 45 movement of said element.

2. In an apparatus of the class described, the combination of a plurality of registering devices, electrical means for simultaneously operating the same, a mechanism operated 50 successively by the persons to be counted, a plurality of circuit-closing devices controlled by the said mechanism, and means for periodically restoring the mechanism to initial position.

3. In an apparatus of the class described, the combination of a plurality of registering devices, electrical means for operating the devices, a contact-carrying element moved 60 step by step in one direction, automatically-actuated means for releasing the said element to return to normal position, and a circuit including the said electrical means and automatically closed and opened by the said element during the return movement thereof.

4. In an apparatus of the class described,

the combination of a registering device, electrical means for actuating the same, a contact-carrying element controlling the circuit of the said means, a manually-actuated mechanism for moving the element step by 70 step in one direction, and a releasing device for permitting the element to return to normal position.

5. In an apparatus of the class described, the combination of a contact-carrying element, means for moving the element step by 75 step in one direction, locking means for the element, a motor-driven device for releasing said locking means, a registering device electrically actuated, and separate contacts on 80 the said element for independently closing the circuits of the said devices.

6. In an apparatus of the class described, the combination of a registering device, electrical means for actuating the same, a manually-actuated contact-carrying element movable step by step in one direction and continuously in the opposite direction, a plurality of contacts yieldingly mounted on said 85 element, a stationary contact with which the other contacts are adapted to successively engage, and a circuit including the said electrical means and controlled by the said contacts.

7. In an apparatus of the class described, 95 the combination of a registering device, a pawl and ratchet mechanism for operating the same, an electro-magnet for actuating said mechanism, a movable element actuated by the successive passengers to be registered, 100 and means for intermittently closing and opening the circuit of the electromagnets by the movement of the said element, with a motor-driven device for periodically releasing the element to permit the latter to return 105 to normal position.

8. In an apparatus of the class described, the combination of a registering device, means for actuating the same, a movable element actuated in one direction by the successive passengers, a device for releasably 110 holding the said element against the return movement, automatically-actuated means for releasing the last-mentioned device, and means on the said element for successively 115 operating the registering device by the return movement of the element.

9. In an apparatus of the class described, the combination of a contact-carrying element, ratchet teeth thereon, a pawl arranged 120 to engage the ratchet teeth, means for moving the element step by step, a spring tending to return the element to normal position, means for periodically retracting the pawl, a registering device, electrical means for actuating the said device, and a circuit including the said means and controlled by the contact-carrying element.

10. In an apparatus of the class described, the combination of a contact-carrying ele- 130

ment, a pawl-carrying member, a ratchet wheel on the element and engaged by the pawl of the said member to move the element step by step, a pawl arranged to prevent the element from returning to normal position; a device for periodically releasing the last-mentioned pawl, an electric motor for driving the said device, a circuit including the said motor and controlled by the movement of the element, an electrically-operated registering mechanism, and a circuit for the latter controlled by the movement of the element.

11. In an apparatus of the class described, the combination of a contact-carrying element, means for moving the latter step by step in one direction, a spring tending to return the element, a releasing device for permitting the element to return to normal position, an electric motor for actuating the said device, a set of contacts on the said element for closing the circuit of the motor, an electrically-actuated registering mechanism, a circuit for the latter, and a set of contacts on the said element for controlling the circuit.

12. In an apparatus of the class described, of a rotary contact-carrying element, ratchet teeth thereon, separate pawls cooperating to move the element intermittently in one direction, means for releasing one of the pawls, a motor for returning the element to normal position when the pawl is released, an electrically-actuated registering mechanism, a circuit therefor, and a plurality of pivotally-mounted contacts on the said element for controlling the circuit.

13. In an apparatus of the class described, the combination of a rotary element composed of spaced disks, a plurality of pivoted members on the element and insulated from the disks, a pair of insulated contacts on each member, and springs electrically connecting certain of the contacts with one disk and the remaining contacts with the other disk and yieldingly holding the members in normal position.

14. In an apparatus of the class described, the combination of a contact-carrying element, means for moving the element in one direction, a device tending to return the element, a locking member for preventing the return of the element, mechanism for releasing the locking member and including an electric motor, a circuit for the motor, a stationary contact included in the said circuit, a plurality of contacts on the element for successively engaging the stationary contact to control the motor circuit, a second circuit including electrical actuating means, a second stationary element included in the last-mentioned circuit, and another set of contacts on the element arranged to successively engage the second stationary contact to control the circuit thereof.

15. In an apparatus of the class described,

the combination of a contact-carrying element, a step-actuated device for operating the element, means tending to return the element to initial position, a locking means for holding the element against return movement by the first-mentioned means, a mechanism for periodically releasing the locking means, a signal actuated by the said device, electrically-controlled registering means, and a circuit for the latter controlled by the contact-carrying element.

16. In an apparatus of the class described, the combination of a contact-carrying element, means for moving the same step by step and including a back-acting pawl, a device for releasing the said pawl to permit the element to return, and a registering mechanism controlled by the element.

17. In an apparatus of the class described, the combination of a step-actuated element, a registering mechanism controlled by the said element, a step for actuating the element in one direction, a spring for moving the element in the opposite direction, a device for preventing the element from moving under the pressure of the spring, and a releasing mechanism for the said device comprising a motor-driven screw, a traveler on the screw, and means actuated by the traveler for disengaging the device from the element.

18. In an apparatus of the class described, the combination of a step-actuated element, a registering mechanism controlled thereby, a pawl for preventing the return of the element, and a releasing device for periodically disengaging the pawl from the element, said device comprising a motor-driven screw, a traveler thereon, and means between the traveler and pawl for retracting the latter.

19. In an apparatus of the class described, the combination of a movable element, a step-operated means for moving the element in one direction, a locking member for controlling the return of the element, a traveler for periodically releasing the locking member, and means for driving the traveler.

20. In an apparatus of the class described, the combination of an element movable intermittently in one direction and continuously in the opposite direction, a locking member for controlling the return movement of the element, a rack and pinion device for moving the locking member, a traveler for periodically retracting the locking member and operating through the said device, and a driving mechanism for the traveler.

21. In an apparatus of the class described, the combination of a movable contact-carrying element, a step-actuated pawl, a back-acting pawl cooperating with the other pawl for moving the element step by step in one direction, means tending to return the element, and a releasing mechanism for the back-acting pawl, said mechanism compris-

ing a motor-driven traveler, a device connected with the back-acting pawl and periodically engaged by the traveler for retracting the said pawl, and an automatically-controlled reversible motor for the traveler.

22. In an apparatus of the class described, the combination of a movable element, a step by step device for the said element and including a back-acting pawl, and separate travelers for periodically releasing the pawl.

23. In an apparatus of the class described, the combination of a movable element, ratchet teeth thereon, an active pawl engaging the teeth to move the element in one direction, a back-acting pawl for preventing the return of the element, a spring for returning the element, and a mechanism for retracting the last-mentioned pawl, said mechanism comprising separate devices for periodically and alternately retracting said pawl.

24. In an apparatus of the class described, the combination of a movable element, ratchet teeth thereon, an active pawl, manually-actuated means for operating the pawl, a back-acting pawl, a device for releasing the back-acting pawl, and means for throwing the back-acting pawl into operative position preparatory to the operation of the active pawl.

25. In an apparatus of the class described, the combination of a movable element, a step by step device for actuating the same and including a back-acting pawl, a traveler, a device for retracting the pawl by the traveler and including a yielding member, and means operating through the last-mentioned device for throwing the back-acting pawl into operative position preparatory to the movement of the element.

26. In an apparatus of the class described, the combination of a movable element having ratchet teeth, an active pawl, a rod carrying the same, a back-acting pawl, a rotary shaft connected with the last-mentioned pawl for retracting the same, separate travelers, a member actuated by each traveler and including a yielding device for retracting the back-acting pawl, a connection between each member and the said shaft, and means on the pawl-carrying rod for engaging one of the members to throw the back-acting pawl into operative position.

27. In a passenger registering apparatus for cars, the combination of a registering device, electrical means for actuating the same, circuits for the said means, separate contact-carrying elements for closing the circuits, passenger-actuated members for operating the elements, means for periodically releasing the elements to return to normal position, steps arranged in cooperative relation with the members, and means for throwing any step out of operation.

28. In an apparatus of the class described,

the combination of a plurality of elements, a step connected with each element for intermittently actuating the same in one direction, means for returning each element to normal position, a releasing mechanism for permitting the elements to periodically return, and an electrically-controlled registering device controlled by the elements.

29. In an apparatus of the class described, the combination of a plurality of contact-carrying elements, separate means for actuating the same in one direction, means tending to return the elements, devices controlling the return of the elements, means for periodically releasing the devices, a registering mechanism including electrical actuating means, a circuit therefor, and a stationary contact included in the circuit and successively engaged by the contacts of each element to intermittently close and open the circuit.

30. In an apparatus of the class described, the combination of a plurality of contact-carrying elements, a registering mechanism controlled thereby, steps connected with the elements for independently actuating the same in one direction, releasable members controlling the return of the elements, means tending to return the elements, a motor-driven device for periodically releasing the members, a circuit for the motor closed by the movement of the elements by the steps, and an automatically-actuated reversing switch included in said circuit.

31. In an apparatus of the class described, the combination of a plurality of separately-actuated elements, steps or platforms for moving the elements in one direction, springs for returning the elements, members releasably engaging the elements for controlling the return thereof, a traveler arranged to release the members, a motor actuating the traveler, a circuit for the motor, means on the elements for closing the said circuit when the elements are moved in one direction, an electrically-actuated registering device, a circuit therefor, and means on the elements for closing the second circuit during the return of the elements.

32. In an apparatus of the class described, the combination of a contact-carrying element, means for moving the same intermittently in one direction and including a back-acting pawl, a pair of motor-driven travelers for releasing the said pawl to permit the element to return to normal position, a motor circuit, a contact arranged in the circuit and successively engaged by the contacts on the element to close the motor circuit, a reversing switch included in the circuit, and a mechanism actuated by each traveler for throwing the said switch.

33. In an apparatus of the class described, the combination of a plurality of contact-carrying elements, a registering device, elec-

trical means for actuating the same, a circuit
for the said means and intermittently closed
by the said elements, steps for actuating the
elements in a forward direction, means for re-
5 turning the elements, releasable members for
controlling the return of the elements, sepa-
rate travelers for releasing the members,
threaded shafts on which the travelers move,
a motor for simultaneously driving the shafts,
10 a circuit for the motor and arranged to be

closed by the movement of the elements, a
reversing switch in the motor circuit, and a
throwing mechanism actuated by the travel-
ers for reversing the switch.

In testimony whereof I affix my signature 13
in presence of two witnesses.

WALTER S. LYTLE.

Witnesses:

ELIZA J. LYTLE,

FRANK A. PRESSELL.